

### REMARKS

Applicants respectfully request reconsideration of the application, as amended, in view of the following remarks.

The rejections based on the combination of JP '998 and JP '250, and further combined with Kanoto, Kakuta, DERWENT Abstract '039 are traversed.

The claims are limited to a particular subgenus of asymmetric bisazo pigments and an intermediate layer comprising titanium oxide. Neither of these limitations are disclosed anywhere in JP '250.

The JP '998 reference is deficient because it does not teach the particular sulfur-containing antioxidant required by the claims. The JP '998 reference does disclose however that it is possible to have an interlayer between the conductive base material and the photosensitive layer, and this interlayer may include titanium oxide. See, e.g., paragraph [0030] in JP '998. JP '998 also discloses asymmetric bisazo pigments (compounds (I) - 24 and (I) - 29) and  $\pi$ -type non-metal phthalocyanine compounds at paragraph [0035] for example. Thus, JP '998 is the closest prior art, but it nevertheless lacks any teaching of the claimed sulfur-containing antioxidant.

In addition, **Claim 1** has been amended to claim from 0.1 to 5 parts by weight of an organic sulfur-containing compound, based on 100 parts of a charge transport material in the charge transport layer.

The specification states at page 8, lines 17-20:

When an organic sulfur-containing compound is used, the objects of the present invention mentioned above can be attained, i.e., a photoreceptor can be obtained which has good durability and good resistance to light fatigue.

Further, the specification states at page 9, lines 3-9:

In addition, since organic sulfur-containing antioxidants have good compatibility with binder resins and charge transport materials for use in the photosensitive layer, the organic sulfur-containing antioxidants do not separate out of the resins and charge transport materials. Therefore the effects can be effectively enhanced.

Moreover, the specification states at page 30, lines 16-21:

When the concentration of the organic sulfur-containing antioxidant is too low, the desired effects cannot be exerted. On the contrary, when the concentration of the organic sulfur-containing antioxidant is too high, adverse effects such as increase of the residual potential of the resultant photoreceptor tend to be produced.

The Examples in the specification use different organic sulfur-compounds as shown below, while the Comparative Examples do not use the organic sulfur compounds. The Table below summarizes the results from pages 36 -47 of the specification.

	Organic sulfur compound	$\Delta$ VD (V)	Black spots observed from Copy #	Undesired Images
Ex. 1	III-8	170	30,000	none
Ex. 2	III-5	140	35,000	none
Comp. Ex. 1	none	280	20,000	Background fouling
Ex. 3	III-8	100	41,000	none
Ex. 4	III-6	80	45,000	none
Ex. 5	III-8	50	none	none
Comp. Ex. 3	none	180	27,000	Background fouling
Ex. 6	S-3	50	none	none
Ex. 7	III-3	20	none	none
Ex. 8	III-6	20	none	none
Ex. 9	S-1	55	none	none
Ex. 10	S-3	60	none	none
Ex. 11	III-5	20	none	none
Ex. 12	III-6	25	none	none
Ex. 13	S-3	50	none	none
Ex. 14	S-2	50	none	none
Ex. 15	III-4	20	none	none
Ex. 16	III-6	20	none	none
Comp. Ex. 5	none	100	38,000	Background fouling
Comp. Ex. 9	none	105	35,000	Background fouling
Comp. Ex. 13	none	105	38,000	Background fouling

Most notably, the **Comparative Examples which do not have the organic sulfur-containing compound exhibit background fouling.** Such background fouling is not observed in the Examples according to the present invention.

Further, the Rule 132 Declaration filed May 27, 2004, included **Examples A, B and C** each of which included **an organic sulfur-containing antioxidant (S-1, III-3 and III-6 as shown in Table 1 at page 10 of the specification)** and **Comparative Example A** containing **no organic sulfur-containing antioxidant.** The light resistance and image quality were determined. The results are summarized in the Table A below which is copied from the Rule 132 Declaration. **Again there is no background fouling using the organic sulfur-containing compound according to the present invention, while there is background fouling if this compound is not present as in Comparative Example A.**

Table A

	Drum diameter (mm)	Intermediate layer thickness ( $\mu\text{m}$ )	$\angle\text{VD}$ (V)	Black spots observed from Copy #	Undesired Images
Ex. 4 (from page 43 of application)	30	3	80	45,000	no
Ex. 5 (from page 46 of application)	30	3	50	0	no
Ex. A	80	4.5	50	173,000	No
Ex. B	80	4.5	20	0	No
Ex. C	80	4.5	20	0	No
Comp. Ex. A	80	4.5	95	105,000	Background fouling

Thus, a **large number of organic sulfur compounds** has been shown to exhibit superior results. Further, it has been shown that superior results are obtained with compounds III, S-1, S-2 and S-3, thereby rebutting the Examiner's assertion that "there is no evidence on the present record showing that photoreceptors comprising antioxidants S-2 and S-3 provide the same result as shown in the declaration". Page 21, lines 5-1 from the bottom, of the Office Action dated September 29, 2004.

In addition, Applicants have shown that amounts outside the claimed range (0 in the Comparative Examples) do not provide the superior results achieved when using the organic sulfur compound of the present invention.

The unexpected superior results are not disclosed or suggested by JP '998 or any other cited reference. This is clear evidence of the unobviousness of the present invention, and Applicants request that the rejections based on JP '998 combined with JP '250 and further combined with Kanoto, Kakuta, DERWENT Abstract '039 be withdrawn.

The rejections based on the combination of JP '890 and JP '250, and further combined with Kanoto, and U.S. 3,357,989 (Byrne) are traversed.

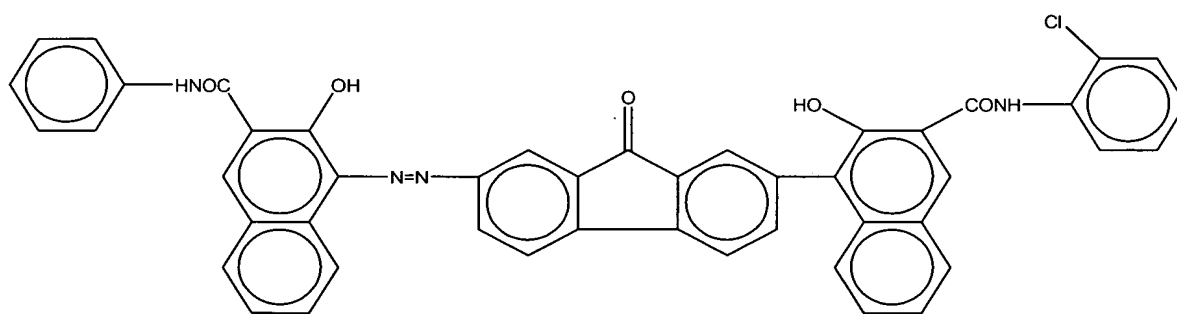
**JP '890 fails to disclose or suggest a sulfur-containing antioxidant as claimed.** In addition, the photoconductor of Example 8 of JP'890 (JP'890 compound (I)-24 which corresponds to formula (VII) of the present invention) and the phthalocyanine pigment (X-form phthalocyanine) are used in Example 9 of the present invention. Example 9 which according to the present invention also contains a sulfur-containing antioxidant, has superior properties as shown in Table 16 at page 46 of the specification. Notably, black spots and undesired images are not observed. The compound of Example 9 of JP'890 (JP'890 compound (I)-29 which corresponds to formula (VIII) of the present invention) is used in Comparative Examples 13-16 formula which show black spots (and background fouling in case of Comparative Example 13). In addition, Applicants previously provided in the Rule

132 Declaration data for a combination of compound (VIII) and X-form phthalocyanine; and data using a photoconductor as in Example 10 of JP'890 (JP'890 compound (I)-30) in combination with X-form metal free phthalocyanine pigment.

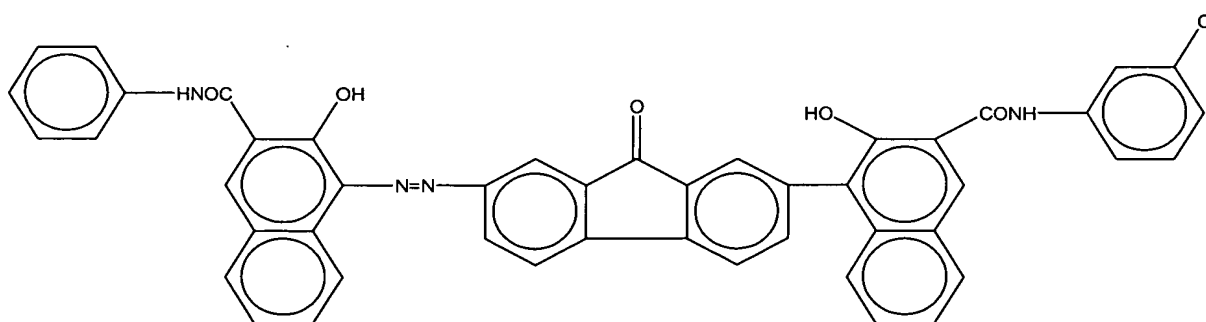
Table B (copied from the Rule 132 Declaration)

	Asymmetric disazo pigment	Additive	$\Delta$ VD	Black spots observed from Copy #	Undesired images
Example D	Formula (VIII)*	(III)-3	20	0	No
Example E	Formula (VIII)*	(III)-5	20	0	No
Example F	Formula (VIII)*	(III)-6	20	0	No
Example G	Formula A**	(III)-3	15	0	No
Example H	Formula A**	(III)-5	20	0	No
Example J	Formula A**	(III)-6	20	0	No
Comp. Ex. B	Formula (VIII)*	No	105	36,000	Background fouling
Comp. Ex. C	Formula (VIII)*	(1)* <sup>3</sup>	90	40,000	No
Comp. Ex. D	Formula (VIII)*	(2)* <sup>4</sup>	95	39,000	No
Comp. Ex. E	Formula (VIII)*	(3)* <sup>5</sup>	105	36,000	No
Comp. Ex. F	Formula A**	No	100	36,000	Background fouling
Comp. Ex. G	Formula A**	(1)* <sup>3</sup>	90	39,000	No
Comp. Ex. H	Formula A**	(2)* <sup>4</sup>	90	38,000	No
Comp. Ex. J	Formula A**	(3)* <sup>5</sup>	100	36,000	No

\*Formula (VIII) (same as (I)-29 in JP '890)



\*\*Formula (A) (same as (I)-30 in JP '890)



\*3: 2,6-di-tert-butyl-p-cresol

\*4: 4,4'-butylidenebis-(6-tert-butyl-3-methylphenol)

\*5: tris(2,4-di-tert-butylphenyl)phosphite

The Examples according to the present invention that use 1) a combination of the compound VIII with X-form metal-free phthalocyanine and a sulfur-containing antioxidant or 2) a combination of compound (I)-30 used in Example 10 of JP '890 with X-form metal-free phthalocyanine and a sulfur-containing antioxidant do not exhibit black spots or undesired images (Examples D-F and G-J). In contrast, **if no sulfur-containing antioxidant is used**, black spots and undesired images occur (Comparative Examples B and F). If other additives are used, the superior properties of the present invention cannot be achieved (Comparative Examples C-E and G-J). Thus, the superior results of the present invention have been demonstrated.

These superior results are not disclosed or suggested by JP '890, JP '250, Kanoto, or U.S. 3,357,989 (Byrne), alone or in combination.

Applicants request that the rejections based on JP '890 and JP '250, and further combined with Kanoto, and U.S. 3,357,989 (Byrne) be withdrawn.

The rejection of Claim 46 as being indefinite is obviated by the amendment of Claim 46.

Applicants submit that the present application is now in condition for allowance and early notice of such action is earnestly solicited.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,  
MAIER & NEUSTADT, P.C.

A handwritten signature in black ink, appearing to read "J. Derek Mason".

J. Derek Mason, Ph.D.  
Attorney of Record  
Registration No. 35,270

Customer Number  
**22850**

Tel.: (703) 413-3000  
Fax: (703) 413-2220

Kirsten A. Grueneberg  
Registration Number 47,297